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Modelling of impurity deposition in gaps of castellated structures in TEXTOR with the 3DGap code — •D. Matveev[1,2], A. Kirschner[2], A. Litnovsky[2], A. Kreter[2], P. Wienhold[2], D. Borodin[2], and G. Van Oost[1] — [1]Department of Applied Physics, Ghent University, Ghent, Belgium — [2]Institut für Energieforschung - Plasmaphysik, Forschungszentrum Jülich GmbH, Association EURATOM-FZJ, Trilateral Euregio Cluster, Jülich

In fusion devices, fuel-rich redeposited layers are formed on plasma shadowed areas and especially in narrow gaps between surface tiles. The Monte-Carlo neutral transport code 3DGap has been developed to study impurity deposition in such gaps. Coupling with Particle-in-Cell simulations allows accounting for plasma penetration into the gaps. The code is applied to study carbon deposition in gaps of the ITER-like castellated test limiter (CTL) and between tiles of the toroidal belt limiter ALT-II of TEXTOR. In case of CTL, the deposition on gap sides can be quantitatively reproduced. However, certain discrepancies remain for the gap bottom. Similarly, deposition at side walls and at the bottom was observed in ALT-II gaps. In this experiment, boronization and normal plasma operation phases were alternated. Atomic ratio boron/carbon of about 3 in the deposit at the bottom in gaps was measured, while carbon dominates deposition near the gap entrance. This issue will be addressed together with the poloidal-toroidal assymetry of carbon deposition in gaps.

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